

THE FIRST SCHOOL BOTANICAL GARDEN OF WORLD

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ABSTRACT: *The paper presents, in the first part, the history of the Botanic Garden School of Blaj (Romania) in the broader context of international concerns on establishing the first school botanical gardens.*

In the second part, the paper presented the general characteristics of the garden, organization and systematization of contents flora, the relationship of collaboration with other botanical gardens in the country or abroad for the enrichment of the flora and concerns of teachers group from school to modernization and development the botanical garden.

Keywords: *botanical garden, plants, plant families, rare plants, natural sciences, biology, forest, greenhouse, shelter, means of education.*

Concern for the arrangement of living plants collections, in the interest of the study, occurred since antiquity, the first "botanical garden" being organized by the Greek physicians, followed by monks of the Middle Ages, most aimed at the cultivation and observation of medicinal plants.

In the Romanian space, the first botanical gardens take being the University of Iasi, Bucharest, Cluj and Cernauti, which are organized by to study, at academic level, the global and regional flora.

Model these gardens, some secondary schools to establish the botanical gardens. The oldest and most complete is the High School Garden of Blaj, followed by those in Targu-Jiu, Turnu Severin, Orastie, Turda, Alba Iulia, Saint Sava National College and Central School in Bucharest.

Botanical Garden of Blaj was arranged on the premises that *“On 18 October 1754 has opened... the courses the first systematic school in our country, where education was taught in Romanian – ȘCOALA DE OBȘTE - open to all and of all ages to learn in reading, writing and singing and no payment of apprentices is expected”*, as is written on

commemorative plaque on the school where *“... have worked as teachers Samuil Micu Clain (1745-1806), Gheorghe Șincai (1754-1816) and Petru Maior (1760-1821), Romanian historians and enlightenments of Transylvania, leaders of the Ardeal School”*, as is written on another record.

Botanical gardens arranged in addition to secondary schools has multifarious types of organization:

- **Botanical gardens** (copied by the university) with a scientific feature, which cultivates a large number of indigenous and exotic plants, in systematic and botanical-geographical groups, in hothouse and temperate flowers garden (for example: Botanic Garden of Wroklav-Poland, which serves all schools in the city, providing them the necessary plants);

- **Gardens of plants**, which grow few plant species that serve as types to treat major systematic groups (for example: Garden of the “Marian High School” in Poznan-Poland, established in 1882);

- **Typical school botanical gardens**, which were established in addition to primary and secondary schools.

The arrangement of schools Botanical gardens are depending on the conditions of each school, but have a characteristic "are worked by school students and include the main plant families or living environments studied in school."

Botanical Garden of Agricultural College of Blaj was established in 1881, by the *Roman School Boys United "St. Basil the Great"*, by the teacher of natural sciences of that time, Alexandru Uilăcan.

Botanical Garden of the high school is the place where it was before Monastery Garden, which had an area much larger than the present Botanical Garden. This was arranged on two sectors: *the garden of trees* (Botanical Garden today) and *market garden*.

By establishing "Preparandia" (Normal School for teachers), in 1864, part of the market garden was arranged as a school tree and agricultural practice for students in this school. In the garden of trees, in 1879, prior Elie Domșa, helped by the metropolitan church gardener, sets out several paths to the primary.

The real parent of the Botanical Garden is professor **Alexandru Uilăcanu** (1846-1927), a passionate botanist who, helped by the gardener Tat, transformed the garden of trees in a park and botanical garden as seen in Cluj. In 1881 began to cut trees in the garden, instead of being arranged nurseries and planted trees from forests of Blaj, or like the layers being planted with annual and perennial species.

Garden has been designed on a geometric plan, with *Thuja*, *Ligustrum* and other shrubs. In the seas were "checkered" where the main cultivated the principal plant families.

Most ornamental plants were grown, as shown in the catalog published in "Yearbook Gymnasium, 1881-1882". They were planted 181 species of plants from 53 families, among which a group of herbs and other of "poisonous plants".

Part of the garden, called "trees area", was intended nursery of fruit trees, where they practice gymnasium students. In this area be cultivated *Morus nigra*, in the so

called "Fragaria", whose leaves were used by students to increase silk worms.

In 1883, on the "coast" of the garden is planted a vineyard, where today are the terraces with rare conifers and rare trees². The vineyard a partially cleared in 1901 and the land was planted with fruit trees. In 1911, with the new arrangement of the garden, the vineyard was totally cleared.

By careful and work of professor Alexandru Uilăcanu, in subsequent years increase the number of species of cultivated plants, trees, shrubs and perennial plants, some students even purchased, received from other individuals (Iuliu Bardosy - school inspector, John and Victor Vancea Mihali - metropolitan, Elie Campeanu and others).

In 1891-1893 part of the garden is occupied by new buildings. This led to another setting and planning by extending to "Freedomfield", where paths have been drawn and were planted trees and shrubs: *Abies alba*, *Robinia pseudocacia*, *Rosa centifolia* etc.

In 1897, to the left of the entry into the garden, are planted a *Pinus robus* (now replaced by a copy) and to right, a *Pinus nigra* and *Taxus baccata*, who exist today. Were planted a few specimens of *Thuja pyramidalis*, now replaced with *Thuja occidentalis* var. *Columna*, planted in 1968. Plants grown in the "checkered" tags were equipped with small table, with the Latin names. Maintenance work to plants in the garden were made in full, with school students.

In 1900-1912 the garden manager was Dr. Ambrosiu Chețeanu (1863-1934), professor of natural sciences, and later, director of the high school. During this period in the Botanical Garden is farm many plants which are studied at school and less ornamental plants. Common species are grown around Blaj, technical plants, medicinal plants and others. Inspector Ludovic Walz donate 200 different species of seed plants from the Botanical Garden of the University of Cluj. And other sponsors donate species of trees and shrubs: jasmine (*Jasminum fruticans*), birch (*Betula pendula*), and species of annual and perennial plants (*Oxalis*, *Gladiolus*, etc.).

In the summer of 1911, Botanic Garden is taken by **Professor Dr. Alexandru Borza** (1887-1971), the great botanist renowned worldwide later (Fig. 1).

From the beginning of his activity, teacher Borza thoroughly reorganized the garden, with the students (Fig. 2).



Fig.1. Alexandru Borza, teacher at Blaj



Fig. 2. Aspect of the old Botanical Garden

During 8 years, the teacher made all the changes and improvements required by a modern school-botanical garden. He reorganized systematically established biologic-environmental groups such as lakes, vegetation, mixed forest, the trees forest, flora of the Apuseni Mountains and Transylvanian Plain and groups of the mediterranean plants and ornamental plants

of East Asian. In addition, it established fields of experience for industrial and medicinal plants in order to popularize the importance of these plants for humans and the economy. In 1912 is create the first **Natural Geographical Environmental Group**, called "Our Forest", which includes all species of wood and grassy forests of oak-hornbeam on Târnavă. This forest is present

in Botanical Garden today, are now being enriched with new forest species.

In 1916, established the biological-ecological group: *Aquatic vegetation of the lake*. Near this group, on two hills, is present the vegetation of Transylvanian Plain and of the Apuseni Mountains. Now is created the *Mediterranean Plants Group*, with *Ficus carica*, *Ruta suaveolens*, *Nerium oleander*, *Agave americana* etc.

In the garden is established too, a small **Terrarium** with turtles, and live free in the garden reptiles, insects and birds.

Throughout the redevelopment, have received seeds from botanical gardens from Berlin, Budapest and Breslau, with which relations of exchange.

In 1916, professor Alexandru Borza receives the visit of Prof. Dr. F. Pax, the Director of Breslau, who admires the richness of plants in Botanical Garden of Blaj.

In 1917, in a shady corner of the garden, at the bottom of it, professor Alexandru Borza arranged an amphitheatre for 80 students, where the fine, take the lessons of botany (Fig. 3).

In 1919, professor Alexandru Borza leaves Blaj, moving as a professor at the University of Cluj, where it awaits a special task, to arrange a large university botanical garden.

Before his departure to Cluj, Prof. Borza has prepared a plan of the Botanical Garden of Blaj, presented in Fig. 4.



Fig. 3. An lesson of botany in the amphitheater

Professor Borza's place is taken by **Ioan-Popu Campeanu** (1886-1961), professor of Natural Science (he was student of Professor Borza), which continues the arrangement and enriches the garden with new plant species. He saw some of old trees and planted, in place, young specimens (*Thuja*, *Picea*, *Tilia*, *Fraxinus*, *Populus*). From seeds received from the botanical garden of Cluj University, inserted copies of the families that were not represented until then: *Verbenaceae*, *Valerianaceae*, *Apocinaceae*, *Asclepiadaceae*, *Plumbaginaceae* etc. Group of exotic

plants is supplemented by new species of *Agave*, *Bacheveria*, *Aloe* and *Opuntia*.

In May 1929, in the middle sector of ornamental plants, at 10 years of the Union of Transylvania with Romania, are planted "Union Oak". In the summer of that year, after the plan devised by Professor Alexandru Borza, has built a greenhouse where winter shelter plants in warm climate zones. By the professor Borza is received, from greenhouse, 78 new plant species. In the southern part of the garden is set up a new group - *Flowers biology*- with several subgroups.

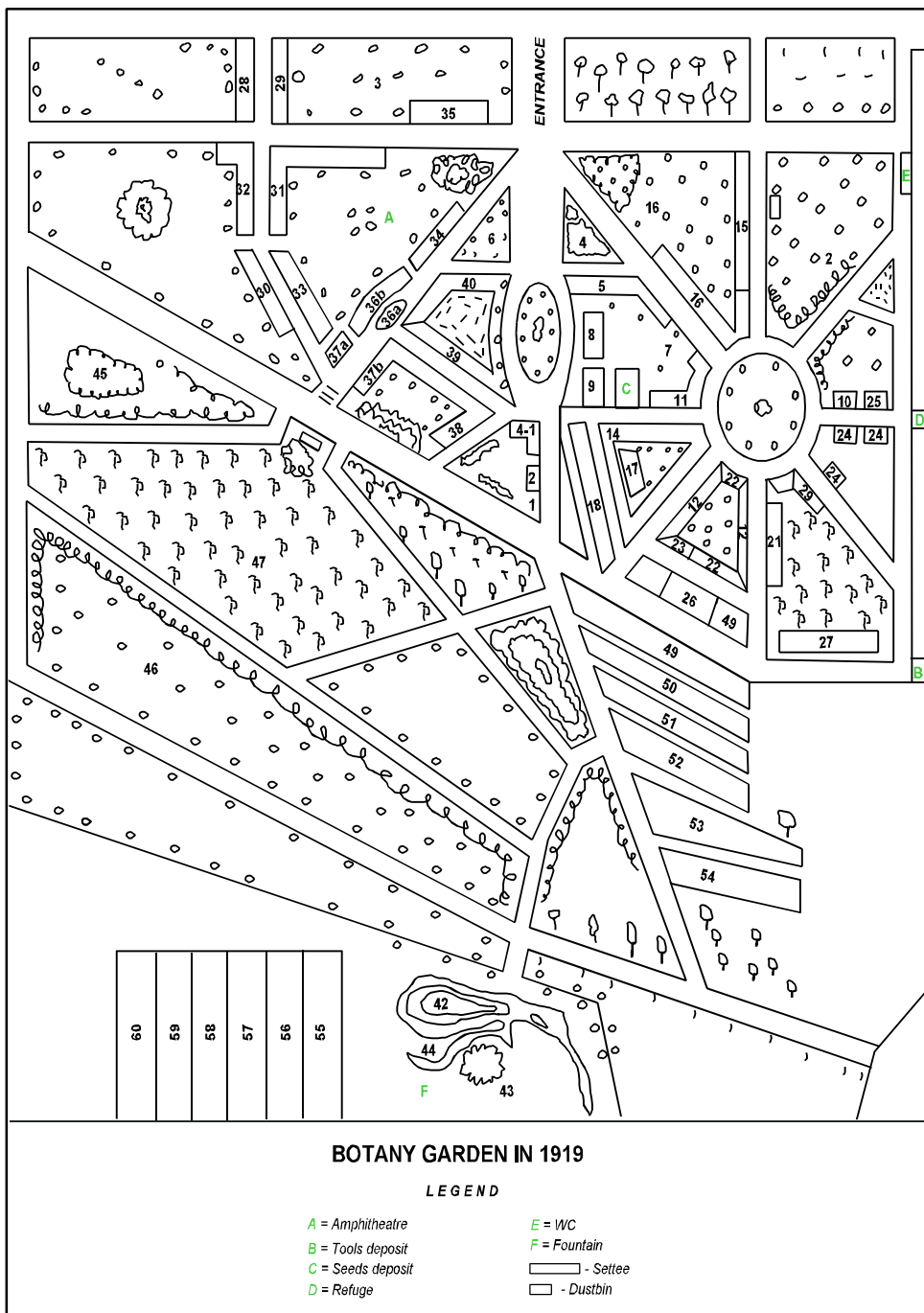


Fig. 4. The Botanical Garden of Blaj, drawn by Alexandru Borza in 1919

Here is arranged the vegetative propagation of plants by roots, rhizome and bulbs. At the bottom of the garden is set up new groups of plants: textiles, poisonous, oily, etc.

In autumn 1929, the Central Institute of Meteorology Bucharest installed in the Botanic Garden of high school, a weather station grade II, where daily were 3 times comments on the pressure, temperature and air humidity and wind direction and intensity.

The sustenance of Botanical Garden has been performed in this period by the students, especially those in classes IV and V, which learned botany, each receiving care in a particular sector of the garden

In 1940, the garden included 69 families with 369 species of plants. Group **Flowers biology** included: 40 plant species, 20 medicinal plant species, 7 poisonous plants species, 11 technical plants species, 21 economic and culinary plants species and 5 lake aquatic plant species. In **Our Forest** and the rest of the garden is found, solitary, 34 species of trees and shrubs in 212 exemplary. Greenhouse plants were represented by 70 species in 124 exemplary.

After the Second War, Botanical Garden knows when the growing period, when the period of decline, caused by the frequent reforms in the education system, which led to change the profile and level schools that have worked in the building of the current Agricultural High School. During 1948-1966, there were fewer than 5 types of schools in the agriculture field.

Between 1941-1955, Professor **George Velici** was the manager of Botanical Garden, and from 1944 to 1955 the second manager was Professor **Simon Barna**.

After 1955, the managers of Botanical Garden was: engineer professor **Agnesa Stoian** (1957-1959) engineer professor **Mihai Popinceanu** (1957-1959), engineer professor **Aurora Rusu** (1960-1965), engineer professor **Victor Suci** (1966-1968) Of this group, deserves special noting the contribution of Victor Suci, who worked in rehabilitation of Botanical Garden and the

contribution of director of high school at that time, engineer **Gheorghe Dima** and his successor, engineer **George Culinski**, who initiated and completed a fundamental restructuring of the garden. This true "reform" of the garden was made in collaboration with specialists from the University Botanical Garden from Cluj-Napoca., preserving it, as was possible, everything that was most valuable in terms of flora composition, no more than replacing some exemplary of old trees and too impaired to young specimens.

Since the school year 1966-1967, at the Biology Department of the Agricultural High School was brought professor **Octavian Codău** which popularized in the media the Botanical Garden of the school and concerns the recovery of it. Articles appearing in local and central newspapers (Unirea, Scanteia Tineretului, Tribuna Scolii) and transmitted several radio shows about rare plants cultivated here and the concerns about the reorganization of the garden.

Beginning 1968-1969 school year, teacher Octavian Codău become the principal manager of the Botanical Garden. His main concern was maintaining the form and content of garden flora. To this end has developed collaborative relationships and exchange of seeds and planting material to the University Botanical Garden in Cluj-Napoca and Simeria Dendrological Park, where you have purchased especially trees and shrubs (*Magnolia cobus*, *Liriodendron tulipifera*, *Koelreuteria paniculate*, *Ptelea trifoliata*, *Abies nordmanniana*, *Abies cephalonica*, *Larix deciduas*, *Larix leptolepis*, *Taxodium distichum*, *Felodendron amurense* etc.).

A part of the plant species grown in the garden today were made by school students from different regions of the country to start the school year or to return from holiday, and the tours and trips in the country or around Blaj. Thus, in the Apuseni Mountains were brought *Leucojum vernum* and *Colchicum autumnale* bulbs, from the area of forest were brought: *Convallaria majalis*, *Corydalis cava*, *Scilla bifolia*, *Galanthus nivalis*,

Erythronium dens canis and saplings of woody species: *Quercus robur*, *Fagus silvatica*, *Betula verrucosa*, *Cornus sanguinea*, *Cornus mas*, *Carpinus betulus*, *Corylus avellana*, planted mostly in the woods to fill the gaps, and by the the steppe were brought: *Adonis vernalis*, *Pulsatilla patens*, *Prunus spinosa*, *Rosa canina*, *Amygdalus nana*, etc.

A particular concern of the teacher Octavian Codău was to domesticate some rarer species, attempts were made to the species: *Ipomoea batatas* (sweet potato) and *Arachis hypogaea* (peanuts), plants of warmer climate and even *Leontopodium alpinum* (edelweiss) from the alpine regions of the Carpathian Mountains, but the plants have survived only a year or two, or have not normally developed. But they managed, after several years of tests, designed to be a little “**break with narcissus**”, thriving year after year a relatively large number of specimens.

The botanical Garden today

The Botanical Garden in present occupies an area of approximately 9000 m², of which 60% ground and 40% land slope, situated at an average altitude of 280 m. The exhibition is S-SE. About half of the area is occupied by the systematic and the ornamental plants and the rest is occupied by forest, plus the area occupied by the greenhouse, shelter and more.

Garden area is small, compared to the area where it had during the years 1881-1940, because they reduce the construction of buildings and sports.

Soil type is "foxy forest", formed on tertiary sediments. Composition and structure of the soil were slightly modified by the work of fertilization. Soil pH values are around 7.

The climate is temperate with a pronounced continental influence, especially in summer, when drought often problems regarding the water reserves in soil.

Quantity rainfall fell in the last 10 years were between 521 mm and 674 mm, with a very uneven distribution give one month to another, as oscillations between values from

4 mm to 155 mm (October and September).

This year, April and May had a very poor rains, which influenced the germination of seeds sown directly into the garden.

The minimum temperature recorded during 2000-2009 is between values of -13° C (January 2000) and -3 ° C (January 2008). Maximum temperatures recorded during the same period were between 32.7 ° C (May 2001) and 38.8 ° C (June 2008). Magnitude difference between maximum and minimum value of 51.8 ° C, is another indication of a temperate climate with continental influences.

Prevailing winds are warm season in the southwest and west, and cold season winds north-west and north. Several storms have caused damage the garden, especially the breaking of trees.

As mentioned in the chapter on history, the Botanical Garden there is a greenhouse to serve Botanical Garden and to make teaching experiments (Fig.5).

Near the greenhouse are two concrete shelter, with an area of approximately 20 m². In the west of the greenhouses is arranged a small weather station, where students make daily observations on the main elements of the time they are recorded on a sheet placed on a school corridor.

The principal alley for access in the Garden separates the ornamental zone by the systematic zone, with a spur to the greenhouse and shelter. Start of this road paths, some paved gravel others, leading to emissions, land for sports fields and teaching. The set of roads and alleys divided the rest of the garden plots and a few triangular and rectangular edges

Trees and shrubs were placed in the plots without always respect their grouping within the family of plants which they belong, which otherwise would have been difficult to achieve. Garden is fenced with concrete fence and wire mesh and a portion to the main entrance, directly adjoins the school building⁶.

All the above can be pursued on current Botany Garden plan, presented in Fig 6.



Fig. 5. The greenhouse of Botanical Garden

The Botanical Garden didactic utility

We are already mentioned that, in the historic Botanical Garden of the high school has a high agricultural value, being the oldest botanical garden in the world established to a secondary school. It was established that in addition to a school, from the outset was intended for educational purposes, providing an important educational tool that has served many generations of students to educate.

Professor Ioan Popu-Campeanu say⁵: *"In a school can not conceive of teaching without the means of education. School who has such means dead. The education I gained knowledge alive. Especial, the natural science without intuition of objects and materials research can not learn. Education must be intuitive, otherwise it is dry and futile"*.

Agricultural education should provide prospective students a theoretical and practical training in the biological sciences, for the base occupies an important place. Biological sciences, along with other specialized study, contributes to the formation of practical skills for work in agriculture.

In biological science teaching in schools to ensure that objectives:

- the acquisition by students of a system of knowledge about the nature of life;
- skills training and skills to use in their life;
- acquiring the concept of scientific bases of the world;
- outfit students with techniques work, the development of cognitive interests and motivations;
- vocational skills and capabilities:
- acquisition of scientific information in an independent manner by observation, description and interpretation of natural materials, models and experiences;
- ability to apply knowledge in new;
- ability to specify the causes of natural spread of plants and animals in different parts of the world or in different ecosystems;
- ability to link biological knowledge with practical usefulness;
- ability to motivate biological laws.

To achieve these objectives, the biological studies appeal to a wide range of media education. We believe that one of the means of education is valuable Botanical Garden School, a real live laboratory that has brought and will bring important services into the future of teaching biological sciences in high school.

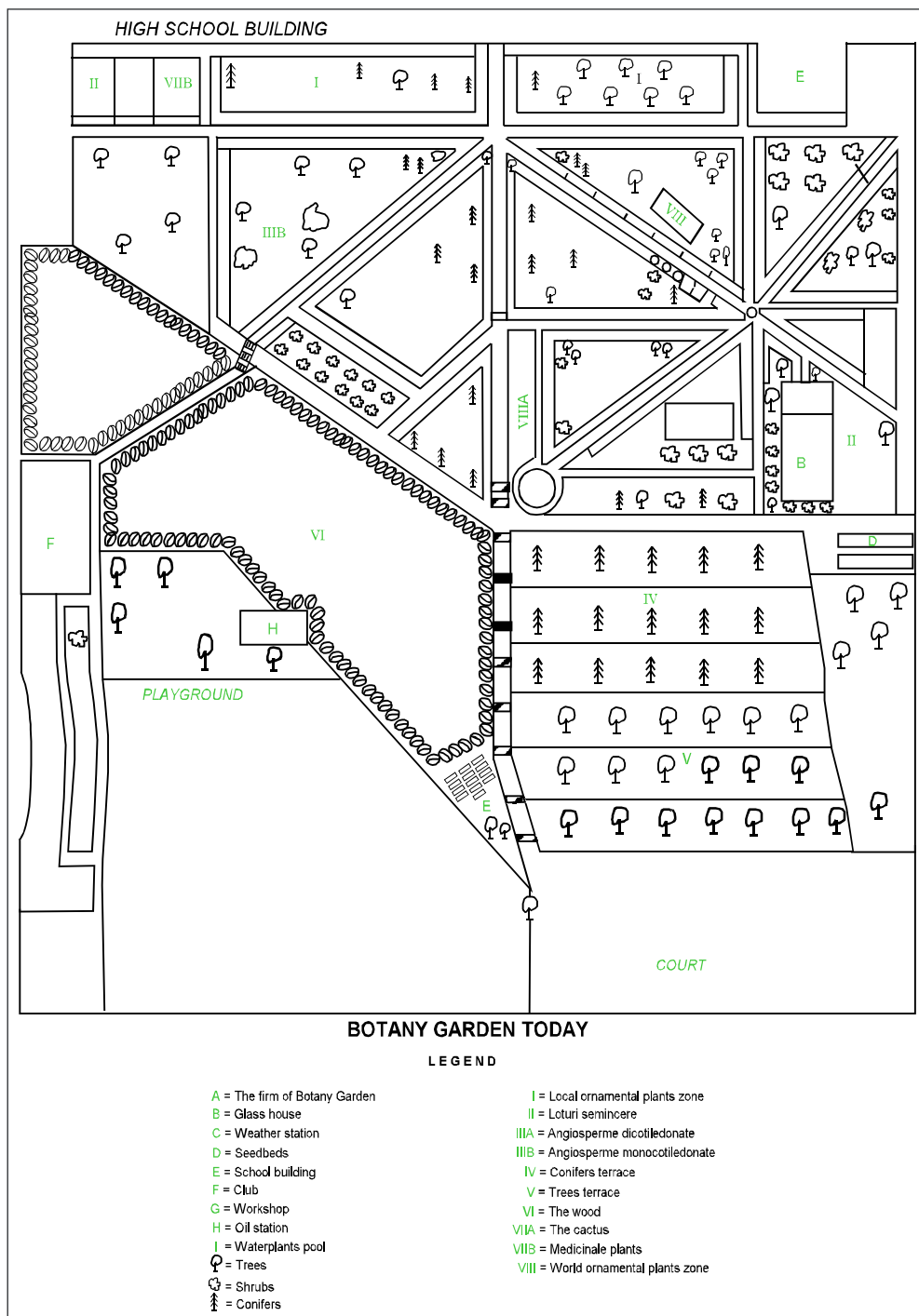


Fig. 6. The Botany Garden plan today

Conclusions

Botanical Garden of the Agricultural High school of Blaj was, for many generations of students, and will be, for future generations, an important means of education. He was and will be in the future a means to educate those that love nature and plants in particular.

Garden has been and will be important for tourists by the flora and the general appearance and for its history, as the first attempt worldwide botanical gardens in schools.

Throughout its history, the Garden has had periods of rising and declining, the problem of current and future is to maintain and improve. Studied here such important personalities in history and culture of the Romanians in Transylvania, who fought for the development of science and culture. The last years finds Botanical Garden in a process

of reorganization, improvement in all aspects, to meet current demands of a modern school botanical gardens.

This has often attracted sanctimonious stories from the feedback of the visiting public, the press, radio and television. Of course there are negative aspects regarding the maintenance of the garden, due to objective or subjective factors. In the summer especially, the Garden is sometimes overlooked because there it is not a permanent employee for greenhouse and garden, and students are away on holiday.

With all the changes incurred during, including decrease its surface, by arrangement of sports or construction of buildings, it is maintained due to a past and a beautiful tradition and will remain so in the future, adding the arsenal of modern education, training and serving the cause of educating future generations.

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